



Talbot Mackenzie & Associates

Consulting Arborists

1114 Rockland Ave, Victoria

Construction Impact Assessment &

Tree Preservation Plan

Prepared For: Praxis Architects Inc.
401-1245 Esquimalt Road
Victoria, BC
V9A 3P2

Prepared By: Talbot, Mackenzie & Associates

Noah Borges
ISA Certified # PN-8409A
TRAQ – Qualified

Date of Issuance: November 1, 2019

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Jobsite Property: 1114 Rockland Ave, Victoria, BC

Date of Site Visits: October 17, 2019

Site Conditions: Vacant building. No ongoing construction activity.

Summary: Pear NT3 and Holly hedge NT4 will be removed. Both of these are shared trees.

Construction of the new building will also likely impact Redwood NT1. The severity of impacts will depend on the number and size of roots encountered for construction of foundation walls, the footing for the nearest support beam, and the at-grade parking area. Root loss could be minimized if the parking area does not require excavation down to bearing soil and a portion of it can be suspended over the root system. If no roots are retained underneath the parking area, we anticipate the health of this tree could be moderately impacted.

If excavation down to bearing soil occurs within the walkway footprint, roots from Chamaecyparis NT5 are likely to be encountered. To mitigate health impacts, the depth of excavation will have to be minimized and the walkway constructed overtop this tree's root system. If any excavation is required within this tree's critical root zone for the installation of underground services, we recommend the project arborist be on site to supervise and less invasive digging methods be used (e.g. hydro-vac in combination with hand digging).

Scope of Assignment:

- Inventory the existing bylaw protected trees and any trees on municipal or neighbouring properties that could potentially be impacted by construction or that are within three metres of the property line
- Review the proposal to demolish the existing building and construct a new five-storey building with underground parking
- Comment on how construction activity may impact existing trees
- Prepare a tree retention and construction damage mitigation plan for those trees deemed suitable to retain given the proposed impacts

Methodology:

- We visually examined the trees on the property and prepared an inventory in the attached Tree Resource Spreadsheet.
- Each by-law protected tree was identified using a numeric metal tag attached to its lower trunk. Municipal trees and neighbours' trees were not tagged.

- Information such as tree species, DBH (1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory.
- The conclusions reached were based on the information provided within the attached plans from Praxis Architects Inc. (dated September 30, 2019).

Limitations:

- No exploratory excavations have been conducted and thus the conclusions reached are based solely on critical root zone calculations and our best judgement using our experience and expertise. The location, size and density of roots are often difficult to predict without exploratory excavations and therefore the impacts to the trees may be more or less severe than we anticipate.
- No servicing plans were provided for this assessment. If any services are to be installed near the east property line, *Chamaecyparis* NT5 may be impacted. We recommend the project arborist review the site servicing plan once available.
- Where trees were not surveyed on the plans provided, we have added their approximate locations (green numbers). The accuracy of our estimated locations has not been verified by a professional surveyor.

Summary of Tree Resource: There are no trees on the subject property. We inventoried 7 trees located on adjacent properties, including a large Coast Redwood (*Sequoia sempervirens*) near the northeast corner of the lot.

Trees to be Removed:

- **Pear NT3** (~40, 40, 30, 30cm DBH) is a shared, by-law protected tree. It is identified for removal on the attached site plans. In our opinion, this is a reasonable option given the tree's poor health and structural condition. The neighbour must first approve before this tree is removed. This tree is bylaw protected.
- **Holly hedge NT4** (multistem): This is a shared hedge of 15 trees with stems up to 16cm DBH. It is identified for removal on the attached site plans. The new building will be constructed immediately adjacent to the hedge.

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Coast Redwood NT1 (122cm DBH):** This tree is growing immediately adjacent to the east property line. Though it is separated by a concrete retaining wall, we expect roots from this tree grow onto the subject property. The attached site plans indicate two rooms will be constructed at the north end of the property at level 1. Foundation walls are proposed to be constructed as near as 3.5m away. An at-grade parking area will also be constructed, which we estimate will be within 3m from the base of the tree. Based on discussions with the applicant, it is our understanding that either a strip footing or thickened slab will be required at the perimeter of the parking area. If excavation down to bearing soil is required at the perimeter

of the parking area, we anticipate most of the roots from this tree will be severed (most roots are usually found in the upper 30-90cm of soil).

If the parking area does not require excavation down to bearing soil, there may be an opportunity to retain additional roots if a portion of it could be suspended over the tree's roots system. However, even if these roots were to be retained underneath the parking area, they would be covered by an impermeable surface where a permeable one exists currently.

Slightly less than one-quarter of this tree's CRZ will be disturbed, though root growth from this tree is likely restricted to the east by the presence of the neighbour's building, and the majority of the root system may be in the back yard of the subject property. Though this species typically exhibits good tolerance to root loss, without conducting an exploratory excavation, we anticipate the health of this tree could be moderately impacted (the tree will likely show some signs of health stress, but we expect it will recover in the long-term).

It should be noted that this tree is not growing in an ideal location given the proximity of the building on the neighbour's property and that a large portion of its root system is covered by pavement. The neighbour should be informed of the proposed impacts to their tree.

- **Chamaecyparis NT5 (36cm DBH):** This tree is growing approximately 2m from the property line, where a paved walkway is proposed to be constructed. If excavation down to bearing soil occurs within the walkway footprint, roots from this tree are likely to be encountered. To mitigate health impacts, the depth of excavation will have to be minimized and the walkway constructed overtop this tree's root system (see "Paved Surfaces Above Tree Roots" section below). We recommend the project arborist supervise all excavation within the CRZ of this tree. The neighbour should be informed of the proposed impacts to their tree. It should be noted that the tree is not by-law protected.
- **Service Connections:** No servicing plans were provided for this assessment. If any services are to be installed near the east property line, Chamaecyparis NT5 may be impacted. Less invasive digging methods will be recommended if any excavation is required within the CRZ of this tree (e.g. hydro-vac in combination with hand digging). We recommend the project arborist review the site servicing plan once available.
- **Trees NT2, NT6, and NT7:** These trees are located on the north neighbour's property. We do not anticipate excavation will be required within the CRZs of the Sweetgum trees (NT2 and NT6) and only a small portion of the pear tree's (NT7) CRZ will be disturbed. If excavation can be limited to 1m outside the building footprint, we anticipate excavation will not occur within 4m of the base of the tree and do not anticipate its health will be impacted.
- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. This includes (but is not limited to) the following activities within CRZs:
 - Any excavation within the CRZ of Redwood NT1

- **Pruning Roots:** Any severed roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. Backfilling the excavated area around the roots should be done as soon as possible to keep the roots moist and aid in root regeneration. Exposed roots should be kept moist until the area is backfilled, especially if excavation occurs during a period of drought. This can be accomplished in a number of ways, including wrapping the roots in burlap or installing a root curtain of wire mesh lined with burlap, and keeping the area moist throughout the construction process.
- **Barrier Fencing:** The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zones.

The barrier fencing must be a minimum of 4 feet in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with plywood, or flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

- **Minimizing Soil Compaction:** In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:
 - Installing a layer of hog fuel or coarse wood chips at least 20 cm in depth and maintaining it in good condition until construction is complete.
 - Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top.
 - Placing two layers of 19mm plywood.
 - Placing steel plates.
- **Demolition of the Existing Building:** The demolition of the existing house and any services that must be removed or abandoned, must take the critical root zone of the trees to be retained into account. If any excavation or machine access is required within the critical root zones of trees to be retained, it must be completed under the supervision and direction of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.
- **Paved Surfaces Above Tree Roots:**

If the new paved surfaces within the CRZs of trees to be retained require excavation down to bearing soil and roots are encountered in this area, their health or stability could be impacted. If tree retention is desired, a raised and permeable paved surface should be constructed in the

areas within the critical root zone of the trees. The “paved surfaces above root systems” diagram and specifications is attached.

The objective is to avoid root loss and to instead raise the paved surface and its base layer above the roots. This may result in the grade of the paved surface being raised above the existing grade (the amount depending on how close roots are to the surface and the depth of the paving material and base layers). Final grading plans should take this potential change into account. This may also result in soils which are high in organic content being left intact below the paved area.

To allow water to drain into the root systems below, we also recommend that the surface be made of a permeable material (instead of conventional asphalt or concrete) such as permeable asphalt, paving stones, or other porous paving materials and designs such as those utilized by Grasspave, Gravelpave, Grasscrete and open-grid systems.

It could also be constructed as a “ribbon driveway” with an unpaved area between the two-tracks.

- **Mulching:** Mulching can be an important proactive step in maintaining the health of trees and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. No mulch should be touching the trunk of the tree. See “methods to avoid soil compaction” if the area is to have heavy traffic.
- **Blasting:** Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.
- **Scaffolding:** This assessment has not included impacts from potential scaffolding including canopy clearance pruning requirements. If scaffolding is necessary and this will require clearance pruning of retained trees, the project arborist should be consulted. Depending on the extent of pruning required, the project arborist may recommend that alternatives to full scaffolding be considered such as hydraulic lifts, ladders or platforms. Methods to avoid soil compaction may also be recommended (see “Minimizing Soil Compaction” section).
- **Landscaping and Irrigation Systems:** The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technician consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the

irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on tree health and can lead to root and trunk decay.

- **Arborist Role:** It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:
 - Locating the barrier fencing
 - Reviewing the report with the project foreman or site supervisor
 - Locating work zones, where required
 - Supervising any excavation within the critical root zones of trees to be retained
 - Reviewing and advising of any pruning requirements for machine clearances
- **Review and Site Meeting:** Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any site clearing, tree removal, demolition, or other construction activity occurs and to confirm the locations of the tree protection barrier fencing.

Please do not hesitate to call us at (250) 479-8733 should you have any further questions.

Thank you,



Noah Borges
ISA Certified #PN- 8409A
TRAQ – Qualified

Talbot Mackenzie & Associates
ISA Certified Consulting Arborists

Encl. 1-page tree resource spreadsheet, 1-page site survey, 9-page site and building plans, 1-page specification for constructing paved areas above tree roots, 1-page barrier fencing specifications, 2-page tree resource spreadsheet methodology and definitions

Disclosure Statement

The tree inventory attached to the Tree Preservation Plan can be characterized as a limited visual assessment from the ground and should not be interpreted as a “risk assessment” of the trees included.

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve their health and structure or to mitigate associated risks.

Trees are living organisms, whose health and structure change, and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. It is not possible for an Arborist to identify every flaw or condition that could result in failure or can he/she guarantee that the tree will remain healthy and free of risk.

Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

1114 Rockland Ave
Tree Resource Spreadsheet

Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations
NT1	Coast Redwood	<i>Sequoia sempervirens</i>	122	10	12.0	Good	Fair	Good	Neighbours tree, separated by retaining wall
NT2	Sweetgum	<i>Liquidambar styraciflua</i>	15	5	2.0	Moderate	Good	Fair	1.5 from property line
NT3	Pear	<i>Pyrus spp.</i>	~40, 40, 30, 30	8	10.0	Moderate	Poor	Poor	Shared, decay and dieback
NT4	Holly hedge	<i>Ilex spp.</i>	Multistem	4	2.0	Good	Fair	Fair	Row of 15 holly stems, shared, up to 16cm DBH
NT5	Chamaecyparis	<i>Chamaecyparis spp.</i>	36	6	4.5	Moderate	Fair	Fair	2 meters from property line
NT6	Sweetgum	<i>Liquidambar styraciflua</i>	15	4	2.0	Moderate	Good	Fair	
NT7	Pear	<i>Pyrus spp.</i>	50	8	6.0	Moderate	Fair	Fair	1 meter from property corner

BC LAND SURVEYORS SITE PLAN OF:

Civic: 1114 Rockland Aveue

Legal Lot 1576, Victoria City

August 06, 2019

File : 12,873 - 9

POWELL & ASSOCIATES

B C Land Surveyors

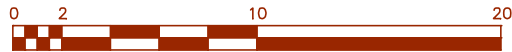
250-2950 Douglas Street

Victoria, BC V8T 4N4

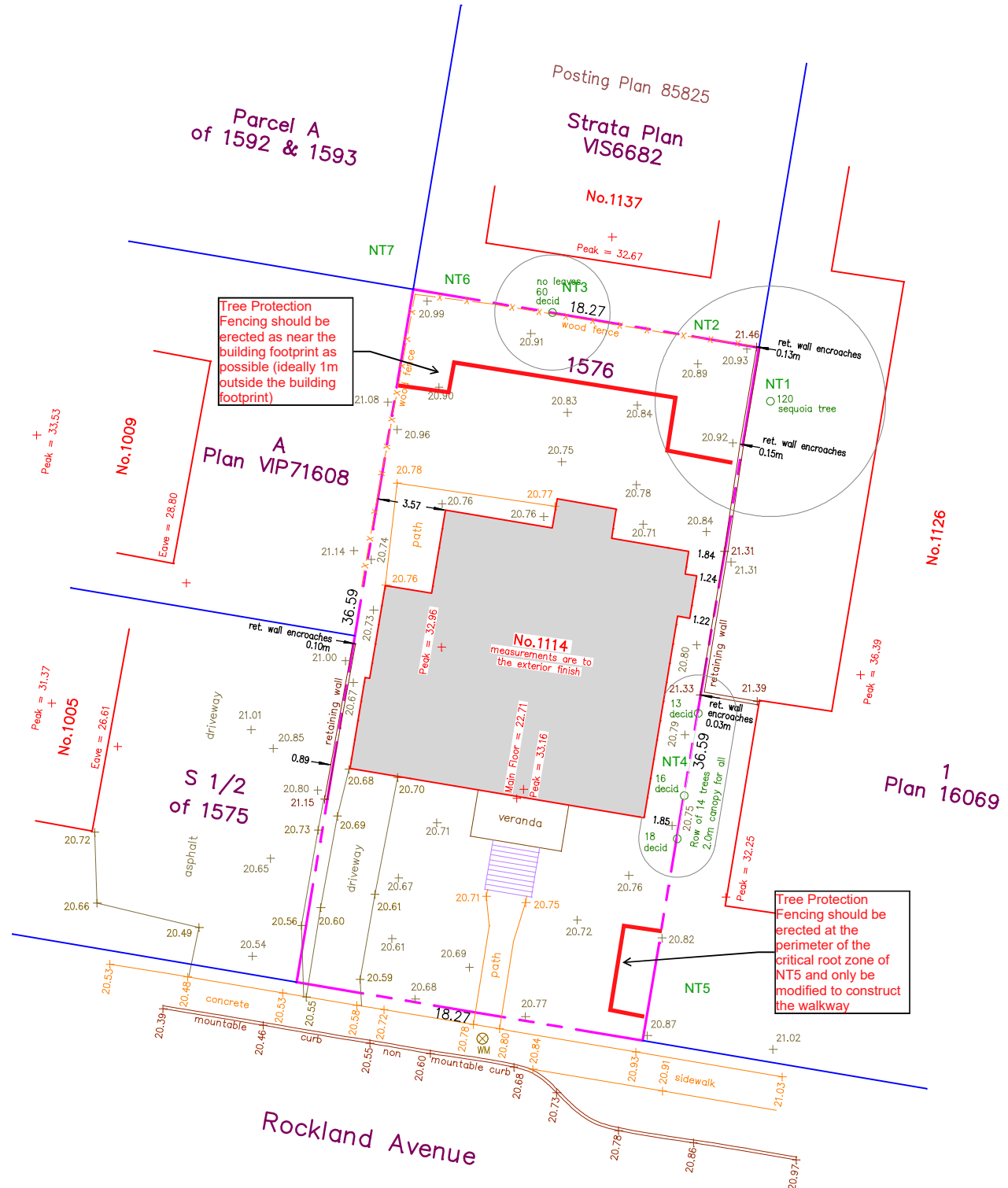
phone (250) 382-8855

Parcel Identifier: 005-212-332 in the City of Victoria

Scale - 1 : 200 Distances are in metres.



The intended print size is 11" by 17".



LEGEND

Elevations are to geodetic datum.

+ - denotes - existing elevation

WM - denotes - Water Meter

Tree diameters are in centimetres.

Lot Area = 668.5 m²

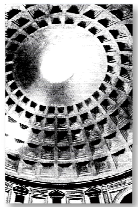
The following non-financial charges are shown on the current title and may affect the property.
M76301 - Undersurface Rights

Setbacks are derived from field survey.

Parcel dimensions shown hereon are derived from Land Title Office records.

This document shows the relative location of the surveyed features and shall not be used to define property boundaries.

ROCKLAND REDEVELOPMENT



ROCKLAND REDEVELOPMENT

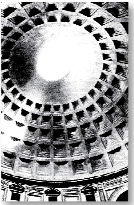
1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

STREET DETAIL

2019.09.30 - REVISED PER PLANNING



SECTION 21: NEIGHBOURHOOD DIRECTIONS



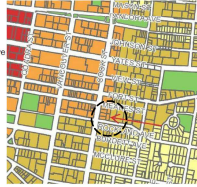
PRAXIS
architects inc.

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SECTION 6: LAND MANAGEMENT AND DEVELOPMENT

**MAP 2
Urban Place
Designations**

- Core Historic
- Core Business
- Core Employment
- Core Inner Harbour/Legislative
- Core Residential
- Core Employment
- Employment-Residential
- Industrial Employment
- Industrial Employment-Residential
- Marine Industrial
- Town Centre
- Large Urban Village
- Small Urban Village
- Urban Residential
- Traditional Residential
- Public Facilities, Institutions, Parks and Open Space
- Rail Corridor
- Working Harbour
- Marine



Urban Place Designations extend to the corners of adjacent streets.

**MAP 21
Fairfield Strategic
Directions**

- Core Residential
 - Large Urban Village
 - Small Urban Village
 - Urban Residential
 - Traditional Residential
 - Public Facilities, Institutions, Parks and Open Space
 - Marine
- Public Facilities**
- Existing Public School
 - Community Centre
 - Seniors Centre

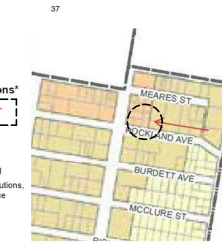
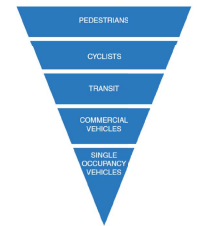


Figure 10: Hierarchy of Transportation and Mobility Priorities



CONCEPTUAL VIEW FROM SOUTH / WEST

SECTION 6: LAND MANAGEMENT AND DEVELOPMENT

Designation	Built Form	Place Character Features	Uses	Density
Core Residential	Multi-unit residential, commercial and mixed-use buildings from three storeys up to approximately 20 storeys. Large floor-plate commercial and institutional buildings oriented to the street. Buildings up to approximately eight storeys for the area east of Cook Street/south of Pandora Avenue/north of Meares Street. Buildings up to approximately six storeys for areas south of Meares Street/east of Quadra Street, and north of Pandora Avenue/east of Cook Street.	Three to five storey building facades define the street wall with upper storeys set back above. Buildings set close to the street to define the public realm along retail streets, with landscaped setbacks in more residential areas, wide sidewalks, regularly spaced tree planting. Building heights are greatest along Yates Street and Blanchard Street. Off-street parking structured, underground or located at the rear.	Diverse housing types, including low, mid, and high-rise multi-unit residential and mixed-use. Commercial, including office and visitor accommodation. Institutional and complementary uses. Home occupations.	Total floor space ratios generally ranging from a base of 3:1 to a maximum of 5.5:1 for the area south of Mason Street/east of Quadra Street/west of Vancouver Street/west of Cook Street/ on Pandora Avenue. Total floor space ratios ranging from a base of 1:1 to a maximum of 2:1 for areas on Mason Street/east of Vancouver Street/west of Cook Street. Total floor space ratios ranging from 2:1 up to approximately 3.5:1 for the areas east of Cook Street, and south of Meares Street/east of Quadra Street/west of Cook Street. Total floor space ratios ranging from a base of 3:1 to a maximum of 5:1 for the area west of Quadra Street/north of Pandora Avenue/south of Caledonia Avenue. Total commercial floor space ratios up to 1:1 except along Pandora Avenue (base of 1:1 to a maximum of 3:1), and Yates Street and Fort Street (base of 3:1 to a maximum of 5.5:1 west of Cook Street and a base of 2:1 to maximum of 3.5:1 east of Cook Street).



CONTEXT PLAN



PROPOSED PROJECT INFORMATION

EXISTING ZONING	RS-1 LOW PROFILE MULTIPLE DWELLING DISTRICT
PROPOSED ZONE	NEW COMPREHENSIVE ZONE
SITE AREA	0.067 Ha / 0.165 Ac / 669 m ² / 7,201 ft ²
TOTAL FLOOR AREA	1,337 m ² (14,391 ft ²)
FLOOR SPACE RATIO	2.0: 1
SITE COVERAGE	56.8 %
OPEN SITE SPACE	30.4%
HEIGHT	18.9m
NO. STOREYS	5 STOREYS WITH ROOFTOP ACCESS
PARKING PROVIDED	13
BIKE PARKING	44 CLASS 1 (2 / UNIT) 6 CLASS 2 (RACK FOR 6 @ BIKE REPAIR ZONE) 4 POSSIBLE ADDITIONAL ON BOULEVARD
BUILDING SETBACKS	FRONT (ROCKLAND AVE) 4.1m (13.5') REAR 5.9m (19.4') INTERIOR SIDE (WEST) 3.0m (9.8') INTERIOR SIDE (EAST) 3.0m (9.8')
RESIDENTIAL USE DETAILS	NO. UNITS 22 (1BR + 17 2BR + 5) MIN. UNIT FLOOR AREA 34.58 m ² (372.18 ft ²) MAX. UNIT FLOOR AREA 68.9 m ² (741.6 ft ²) TOTAL RES. FLOOR AREA 944 m ² (10,161 ft ²)

DRAWING LIST

- ARCHITECTURAL
- A0 COVER + PROJECT INFO
- A1 SITE
- A2 PRELIMINARY PLANS (BSMT + L1)
- A3 PRELIMINARY PLANS (L2+L5 + ROOF)
- A4 3D CONCEPTUAL VIEWS
- A5 ELEVATIONS
- A6 STREET VIEWS
- A7 SECTIONS
- A8 SHADOW STUDY

LANDSCAPE
LANDSCAPE CONCEPT PLAN
SURVEY

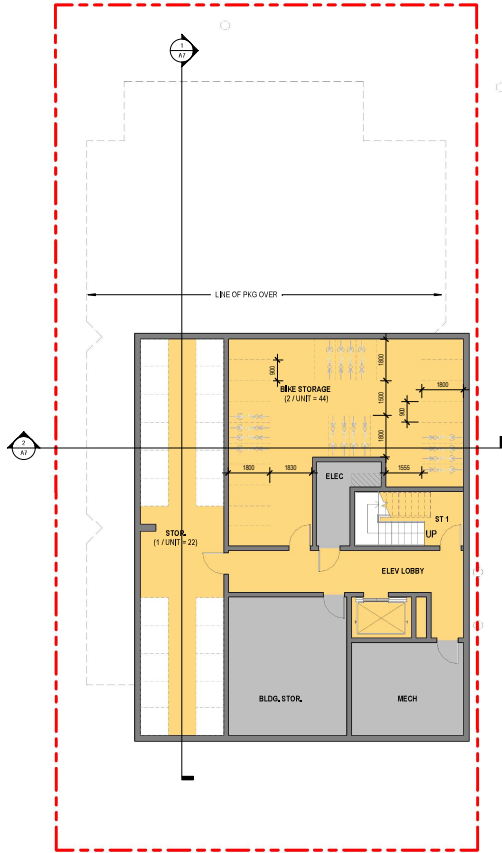
ROCKLAND REDEVELOPMENT

1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

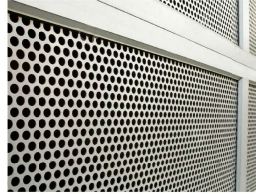
PROJECT INFO + CONTEXT

2019.09.30 - REVISED PER PLANNING

A0



① BASEMENT
1: 100



IMG 01: EXAMPLE OF POSSIBLE OVERHEAD DOOR WITH MESH



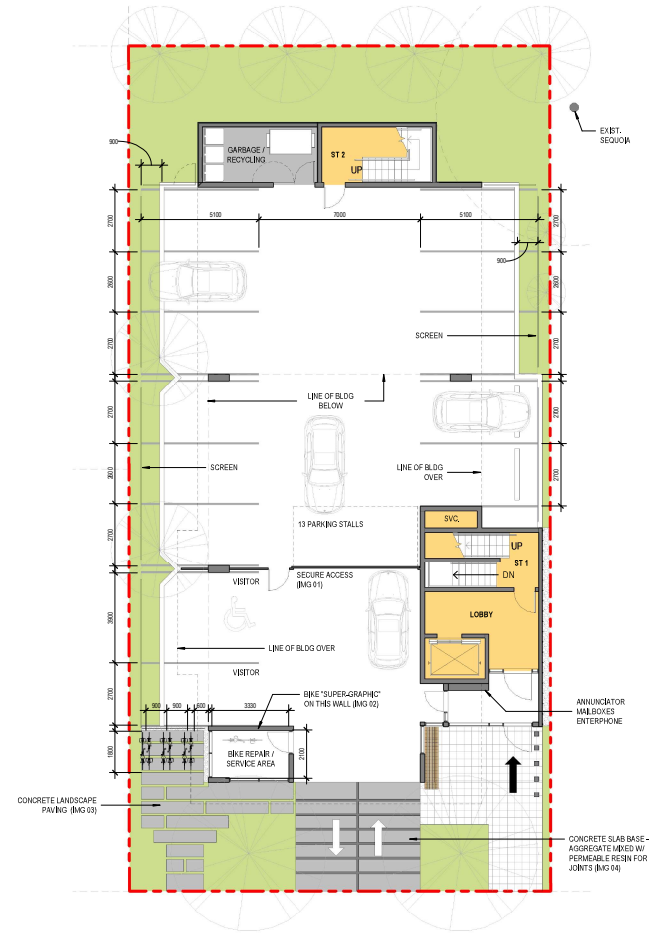
IMG 02: EXAMPLE OF POSSIBLE BIKE "SUPER-GRAPHIC"



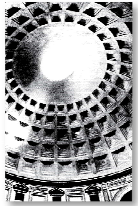
IMG 03: EXAMPLE OF POSSIBLE CONCRETE LANDSCAPE PAVING



IMG 04: EXAMPLE OF POSSIBLE CONCRETE DRIVEWAY PAVING



② LEVEL 1 / PARKADE
1: 100



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ROCKLAND REDEVELOPMENT

1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

PRELIMINARY PLANS (BSMT + L1)
2019.09.30 - REVISED PER PLANNING

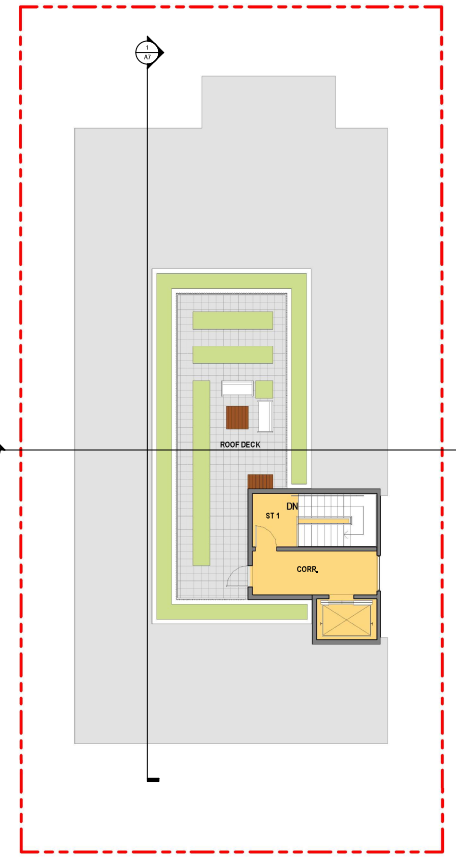
A2



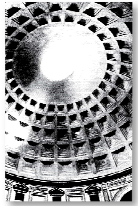
① LEVELS 2-4
1 : 100



② LEVEL 5
1 : 100



③ ROOF DECK
1 : 100



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ROCKLAND REDEVELOPMENT

1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

PRELIMINARY PLANS (L2-L5 + ROOF)
2019.09.30 - REVISED PER PLANNING

A3



① 3D VIEW SW



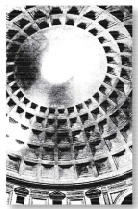
② 3D VIEW S/E



③ 3D VIEW NW



④ 3D VIEW N/E



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ROCKLAND REDEVELOPMENT

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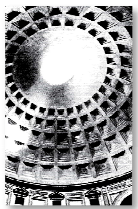
3D CONCEPTUAL VIEWS

20' 9.09.30 - REVISED PER PLANNING

A4



- MATERIAL FINISH LEGEND**
- ① STUCCO - WHITE
 - ② STUCCO - GRAY
 - ③ WOOD GRAIN - PREFIN. METAL
 - ④ STANDING SEAM METAL
 - ⑤ PRIVACY SCREEN / TRELLIS
 - ⑥ SBS MEMBRANE ROOF
 - ⑦ ALUMINUM GUARD
 - ⑧ PVC WINDOWS
 - ⑨ PREFIN. METAL SOFFIT
 - ⑩ PREFIN. METAL FASCIA



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ROCKLAND REDEVELOPMENT

1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

ELEVATIONS

2019.09.30 - REVISED PER PLANNING

A5

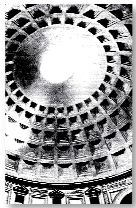




① STREET VIEW - EXISTING



② STREET VIEW - PROPOSED



PRAXIS
architects inc.

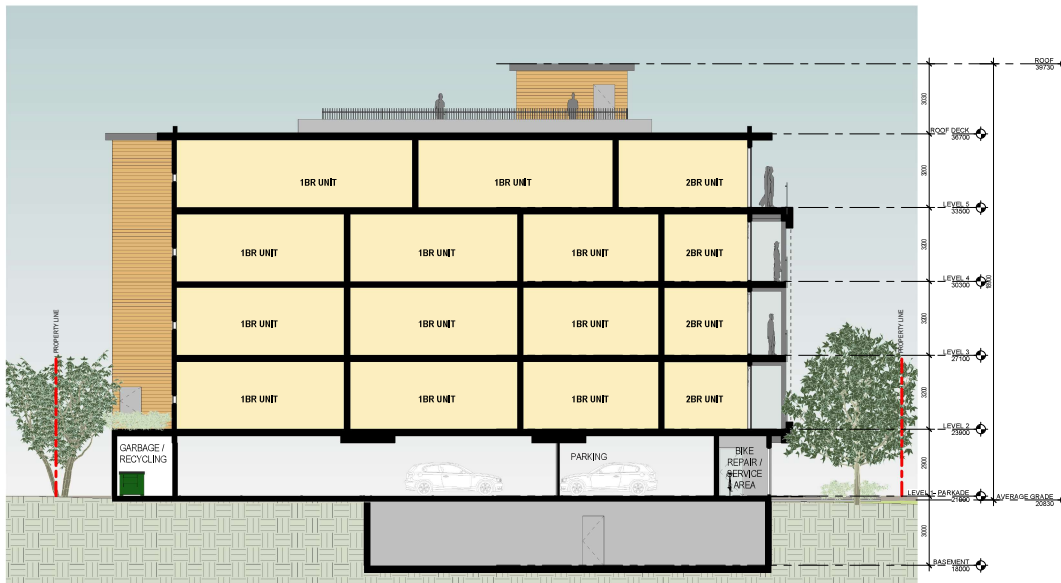
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1114 Rockland Ave Victoria, BC
PROJECT NO.18-016

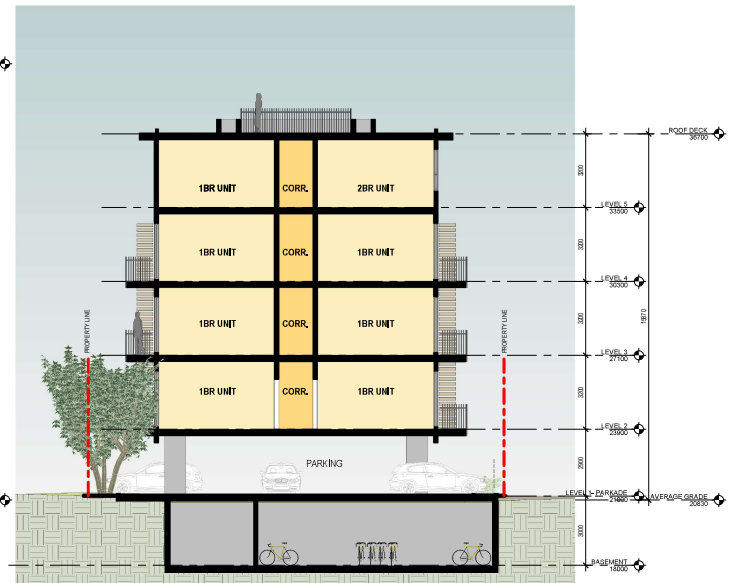
STREET VIEWS

2019.09.30 - REVISED PER PLANNING

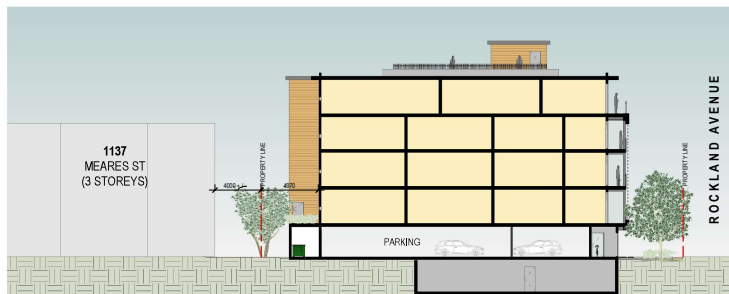
A6



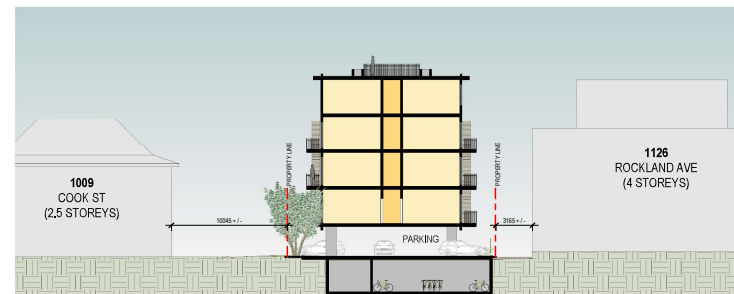
SECTION - LONG
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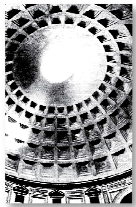
SECTION - SHORT
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SITE SECTION - LONG
1:200



SITE SECTION - SHORT
1:200



PRAXIS
architects inc.

ROCKLAND REDEVELOPMENT

1114 Rockland Ave Victoria, BC
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SECTIONS

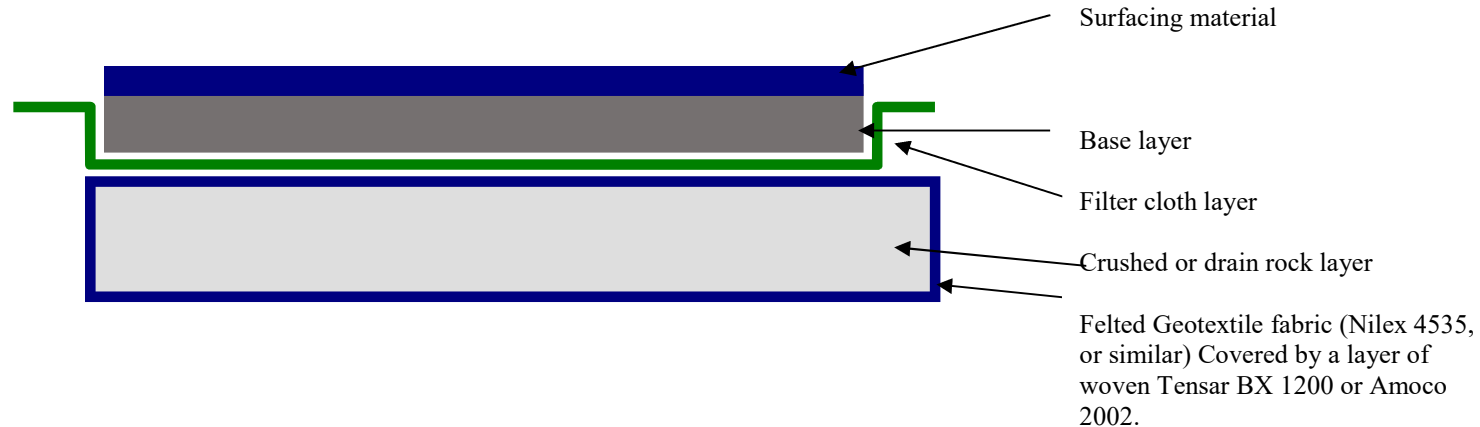
2019.09.30 - REVISED PER PLANNING

A7

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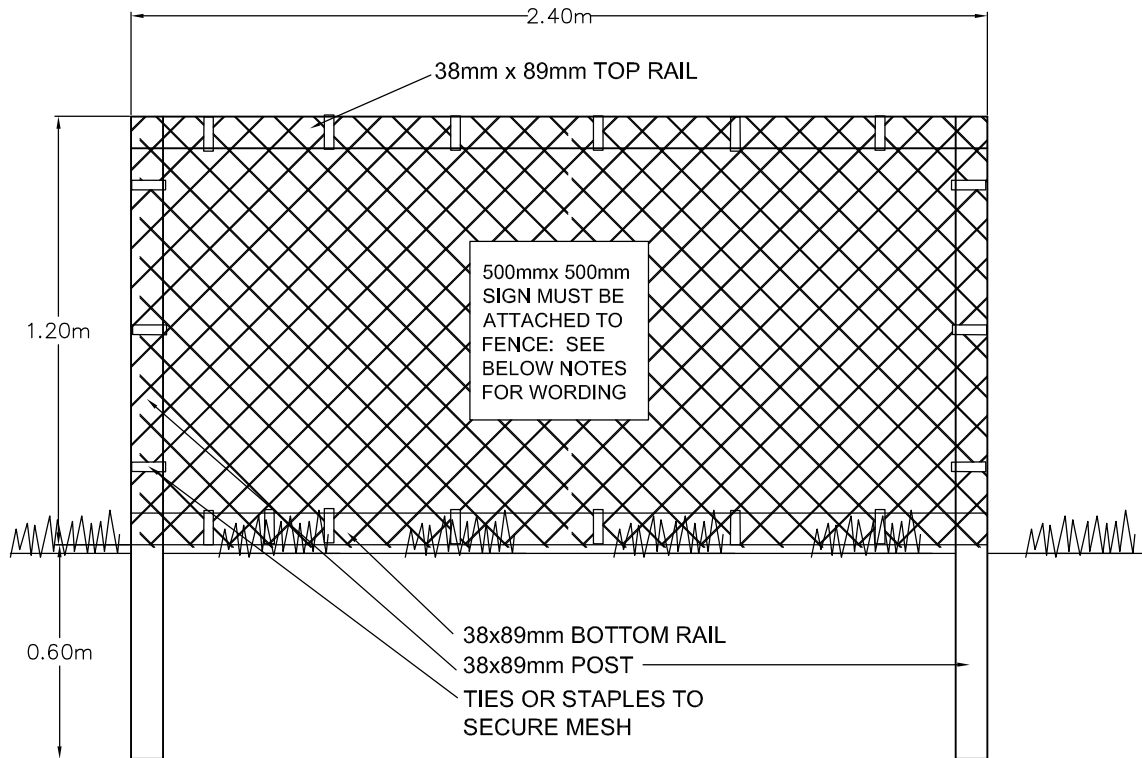
Consulting Arborists

Diagram – Site Specific Driveway, Parking and Walkway



Specifications for Paved Surfaces Above Tree Roots (Driveway, Parking and Walkway Areas)

1. Excavation for construction of the driveway/parking/walkway areas must remove only the top layer of sod and not result in root loss
2. A layer of medium weight felted Geotextile fabric (Nilex 4535, or similar) is to be installed over the entire area of the critical root zone that is to be covered by the paved surface. Cover this Geotextile fabric with a layer of woven Amoco 2002 or Tensar BX 1200. Each piece of fabric must overlap the adjoining piece by approximately 30-cm.
3. A 10cm layer of torpedo rock or 20-mm clean crushed drain rock, is to be used to cover the Geotextile fabric (depth dependent on desired finished grade).
4. A layer of felted filter fabric is to be installed over the crushed rock layer to prevent fine particles of sand and soil from infiltrating this layer.
5. The bedding or base layer and permeable surfacing can be installed directly on top of the Geotextile fabric.
6. Two-dimensional (such as CombiGrid 30/30 or similar) or three-dimensional geo-grid reinforcements can be installed in combination with, or instead of, the geotextile fabric specified in the attached diagram.
7. Ultimately, a geotechnical engineer should be consulted and in consultation with the project arborist may specify their own materials and methods that are specific to the site's soil conditions and requirements, while also avoiding root loss and reducing compaction to the sub-grade.



TREE PROTECTION FENCING

1. FENCE WILL BE CONSTRUCTED USING 38 mm X 89mm WOOD FRAME: TOP, BOTTOM AND POSTS * USE ORANGE SNOW-FENCING MESH AND SECURE THE WOOD FRAME WITH "ZIP" TIES OR GALVANIZED STAPLES.
 2. ATTACH A 500mm X 500mm SIGN WITH THE FOLLOWING WORDING: WARNING- TREE PROTECTION AREA. THIS SIGN MUST BE AFFIXED ON EVERY FENCE OR AT LEAST EVERY 10 LINEAR METERS.
- * IN ROCKY AREAS, METAL POSTS (T-BAR OR REBAR) DRILLED INTO ROCK WILL BE ACCEPTED



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Tree Resource Spreadsheet Methodology and Definitions

Tag: Tree identification number on a metal tag attached to tree with nail or wire, generally at eye level. Trees on municipal or neighboring properties are not tagged.

NT: No tag due to inaccessibility or ownership by municipality or neighbour.

DBH: Diameter at breast height – diameter of trunk, measured in centimetres at 1.4m above ground level. For trees on a slope, it is taken at the average point between the high and low side of the slope.

* Measured over ivy

~ Approximate due to inaccessibility or on neighbouring property

Crown Spread: Indicates the diameter of the crown spread measured in metres to the dripline of the longest limbs.

Relative Tolerance Rating: Relative tolerance of the tree species to construction related impacts such as root pruning, crown pruning, soil compaction, hydrology changes, grade changes, and other soil disturbance. This rating does not take into account individual tree characteristics, such as health and vigour. Three ratings are assigned based on our knowledge and experience with the tree species: Poor (P), Moderate (M) or Good (G).

Critical Root Zone: A calculated radial measurement in metres from the trunk of the tree. It is the optimal size of tree protection zone and is calculated by multiplying the DBH of the tree by 10, 12 or 15 depending on the tree's Relative Tolerance Rating. This methodology is based on the methodology used by Nelda Matheny and James R. Clark in their book "Trees and Development: A Technical Guide to Preservation of Trees During Land Development."

- 15 x DBH = Poor Tolerance of Construction
- 12 x DBH = Moderate
- 10 x DBH = Good

To calculate the critical root zone, the DBH of multiple stems is considered the sum of 100% of the diameter of the largest stem and 60% of the diameter of the next two largest stems. It should be noted that these measures are solely mathematical calculations that do not consider factors such as restricted root growth, limited soil volumes, age, crown spread, health, or structure (such as a lean).

Health Condition:

- Poor - significant signs of visible stress and/or decline that threaten the long-term survival of the specimen
- Fair - signs of stress
- Good - no visible signs of significant stress and/or only minor aesthetic issues

Structural Condition:

- Poor - Structural defects that have been in place for a long period of time to the point that mitigation measures are limited
- Fair - Structural concerns that are possible to mitigate through pruning
- Good - No visible or only minor structural flaws that require no to very little pruning

Retention Status:

- X - Not possible to retain given proposed construction plans
- Retain - It is possible to retain this tree in the long-term given the proposed plans and information available. This is assuming our **recommended mitigation measures are followed**
- Retain * - See report for more information regarding potential impacts
- TBD (To Be Determined) - The impacts on the tree could be significant. However, in the absence of exploratory excavations and in an effort to retain as many trees as possible, we recommend that the final determination be made by the supervising project arborist at the time of excavation. The tree might be possible to retain depending on the location of roots and the resulting impacts, but concerned parties should be aware that the tree may require removal.
- NS - Not suitable to retain due to health or structural concerns